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**AMENDMENTS TO THE CLAIMS:**

Please cancel claims 32, 35 and 38 without prejudice or disclaimer.

1. (Currently amended) A data storage element, comprising:
  - a substrate comprising a semiconductor material;
  - a metal oxide layer comprising an electrically insulating rare earth metal oxide disposed upon a surface of said substrate, said metal oxide layer comprising a predetermined voltage profile for an applied voltage and forming an active element of said data storage element;
  - a conductive material disposed upon said metal oxide layer;
  - a first electrode electrically connected to said conductive material; and
  - a second electrode connected to said substrate, to form said data storage element.
2. (Original) The data storage element as set forth in Claim 1, wherein said metal oxide comprises lanthanum oxide.
3. (Original) The data storage element as set forth in Claim 1, wherein said metal oxide comprises a mixture of lanthanum oxide and aluminum oxide.
4. (Original) The data storage element as set forth in Claim 3, wherein said conductive material comprises metallic aluminum.
5. (Currently amended) The data storage element as set forth in Claim 1, wherein said metal oxide comprises at least one of:
  - 1) lanthanum oxide, and
  - 2) a mixture of lanthanum oxide and aluminum oxide, and said conductive material comprising metallic aluminum.
6. (Currently amended) The data storage element as set forth in Claim 1, wherein said metal oxide layer has a thickness in a range of 10 Angstroms to [-] 10,000 Angstroms.

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7. (Currently amended) The data storage element as set forth in Claim 6, wherein said metal oxide layer has a thickness in a range of 50 Angstroms to [-] 500 Angstroms.

8. (Original) The data storage element according to claim 1, wherein said conductive material comprises polysilicon.

9. (Original) The data storage element according to claim 1, wherein said conductive material comprises Aluminum.

10. (Currently amended) A data storage element, comprising:  
a substrate comprising a semiconductor material having a source region and a drain region formed in a surface of said substrate;  
a layer of metal oxide disposed upon said surface of said substrate and between said source region and said drain region, said metal oxide comprising at least one metal which has a plurality of oxidation states, said metal oxide layer comprising a predetermined capacitance-voltage profile for an applied voltage and forming an active element of said data storage element;  
a conductive layer disposed upon said layer of metal oxide;  
a first electrode electrically connected to said conductive layer;  
a second electrode connected to said source region; and  
a third electrode connected to said drain region, to form said data storage element.

11. (Original) A data storage element as set forth in Claim 10, said semiconductor material being n-doped silicon, said metal oxide comprising at least one of lanthanum oxide and a mixture of lanthanum oxide and aluminum oxide, and said conductive layer comprising n-type aluminum.

12. (Original) The data storage element as set forth in Claim 10, wherein said semiconductor material comprises n-doped silicon.

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13. (Original) The data storage element as set forth in Claim 10, wherein said element comprises at least one of lanthanum oxide, and a mixture of lanthanum oxide and cerium oxide.

14. (Original) The data storage element as set forth in Claim 10, wherein said active layer comprises metallic aluminum.

15-23. (Canceled)

24. (Currently amended) A memory, comprising:

a rare-earth based memory element for storing data based on hysteresis and voltage characteristics thereof, said rare-earth based memory element comprising

a metal oxide layer comprising an electrically insulating rare earth metal oxide disposed upon a surface of said substrate, said metal oxide layer comprising a pre-determined capacitance-voltage profile for an applied voltage and forming an active element of rare-earth based memory element.

25. (Currently amended) The memory as set forth in Claim 24, wherein said memory element comprises:

a substrate;

a metal oxide layer comprising an electrically insulating rare earth metal oxide disposed upon a surface of said substrate, and

a conductive material disposed upon said metal oxide layer.

26. (Original) The memory as set forth in Claim 25, wherein said metal oxide layer comprises lanthanum oxide.

27. (Original) The memory as set forth in Claim 25, wherein said metal oxide layer comprises a

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mixture of lanthanum oxide and aluminum oxide.

28. (Original) The memory as set forth in Claim 27, wherein said conductive material comprises metallic aluminum.

29. (Currently amended) The memory as set forth in Claim 25, wherein said metal oxide comprises at least one of:

- 1) lanthanum oxide, and
- 2) a mixture of lanthanum oxide and aluminum oxide, and said conductive material comprising metallic aluminum.

30. (Original) The memory as set forth in Claim 25, wherein said substrate comprises n-doped silicon, said metal oxide comprising at least one of lanthanum oxide and a mixture of lanthanum oxide and aluminum oxide, and said conductive material comprising metallic aluminum.

31. (Currently amended) The data storage element of claim 1, wherein the metal oxide layer comprises an active element that changes internally as a function of an applied voltage.

32. (Canceled)

33. (Previously presented) The data storage element of claim 1, wherein when an applied voltage is applied between the first and second electrodes, beyond a threshold voltage, charge is accumulated in the metal oxide layer, thereby shifting current-voltage and capacitance-voltage characteristics, and

wherein upon reversal of the applied voltage, beyond a second threshold voltage, the charge in the metal oxide layer is discharged, thereby restoring original current-voltage and capacitance-voltage requirements.

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34. (Currently amended) The data storage element of claim 10, wherein the metal oxide layer comprises an active element that changes internally as a function of an applied voltage.

35. (Canceled)

36. (Previously presented) The data storage element of claim 10, wherein when an applied voltage is applied between the first and second electrodes, beyond a threshold voltage, charge is accumulated in the metal oxide layer, thereby shifting current-voltage and capacitance-voltage characteristics, and

wherein upon reversal of the applied voltage, beyond a second threshold voltage, the charge in the metal oxide layer is discharged, thereby restoring original current-voltage and capacitance-voltage requirements.

37. (Currently amended) The memory of claim 24, wherein said memory element comprises a metal oxide layer on a substrate, and

wherein the metal oxide layer comprises an active element that changes internally as a function of an applied voltage.

38. (Canceled)

39. (Previously presented) The memory of claim 24, wherein when a voltage is applied to said memory, beyond a threshold voltage, charge is accumulated in the memory element, thereby shifting current-voltage and capacitance-voltage characteristics, and

wherein upon reversal of the applied voltage, beyond a second threshold voltage, the charge in the memory is discharged, thereby restoring original current-voltage and capacitance-voltage requirements.